Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (canceled)

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (canceled)

11. (canceled)

12. (canceled)

13. (canceled)

14. (canceled)

15. (canceled)

16. (canceled)

17. (canceled)

18. (canceled)

19. (canceled)

20. (canceled)

21. (canceled)

22. (canceled)

23. (canceled)

24. (canceled)

25. (canceled)

26. (canceled)

27. (canceled)

28. (canceled)

29. (canceled)

30. (canceled)

31. (canceled)

32. (canceled)

33. (canceled)

34. (original) A method for preparing a diaryl carbonate which comprises contacting at least one hydroxyaromatic compound with oxygen and carbon monoxide in the presence of an amount effective for carbonylation of at least one catalyst composition comprising a Group VIIIB metal or a

compound thereof, a bromide source and a polyaniline wherein said catalyst composition is selected according to a genetic algorithm screening process.

35. (original) The method of claim 34, wherein at one of said Group VIIIB metal or compound thereof, said bromide source and said polyaniline is selected by said genetic algorithm screening process.

36. (original) The method of claim 34, wherein a concentration of at least one of said Group VIIIB metal or compound thereof, said bromide source and said polyaniline is selected by said genetic algorithm screening process.

37. (original) The method of claim 34, wherein said Group VIIIB metal or compound thereof, said bromide source and said polyaniline are selected by said genetic algorithm screening process.

38. (original) The method of claim 34, wherein concentrations of said Group VIIIB metal or compound thereof, said bromide source and said polyaniline are selected by said genetic algorithm screening process.

39, (original) The method of claim 34, wherein said Group VIIIB metal or compound thereof, said bromide source and said polyaniline are selected by said genetic algorithm screening process and concentrations thereof are selected by said algorithm screening process.

40. (canceled)

41. (original) A system for screening constructs to determine a problem solution, comprising:

a generator to provide a binary string representing a random first population of said constructs;

a combinatorial reactor to synthesize each construct according to said representation of said first population and to determine a fitness function for each construct of said population by a high throughput screening process; and

an executor to execute a genetic algorithm on said first population to produce a generation that defines a second population of said materials.

42. (new) The method of claim 34, wherein the catalyst composition is selected by a genetic algorithm screening process comprising steps of:

(A) forming a first population of catalytic entities and detecting a catalytic property of each of said entities by a high throughput screening (HTS) method and

(B) executing a genetic algorithm based on said property of said entities to identify a second population of entities.

43. (new) The method of claim 42, wherein said step (B) comprises at least one operation selected from (i) mutation, (ii) crossover, (iii) mutation and selection (iv) crossover and selection and (v) mutation, crossover and selection.

44. (new) The method of claim 42, comprising randomly identifying said first population of entities prior to forming said first population according to step (A).

45. (new) The method of claim 42, further comprising generating a binary string representing said first population of entities and step (B) comprises executing a genetic algorithm with a processor on said binary string to produce a binary string representing said second population of entities.

46. (new) The method of claim 42, further comprising generating a binary string representing variable parameters of said first population of entities and step (B) comprises executing a genetic algorithm with a processor on said binary string to produce a binary string representing said second population of entities.

47. (new) The method of claim 42, further comprising generating a binary string representing variable parameters of entities, forming said entities and selecting said first population from said entities and step (B) comprises executing a genetic algorithm with a processor on said binary string to produce a binary string representing said second population of entities.

48. (new) The method of claim 42, further comprising generating a binary string representing variable parameters of entities, forming said entities, evaluating said entities for a desired property, weighting said entities according to an hierarchy of fitness of said property and selecting said first population as a sampling from said weighed entities and step (B) comprises executing a genetic algorithm with a processor on said binary string to produce a binary string representing said second population of entities.

49. (new) The method of claim 42, further comprising generating a binary string representing variable parameters of entities, forming said entities, evaluating said entities for a desired property, pairing said entities and (B) comprises executing a genetic algorithm with a processor on said binary string to produce a binary string representing said second population of entities.

50. (new) The method of claim 42, further comprising generating a binary string representing variable parameters of entities, forming said entities, evaluating said entities for a desired property and pairing said entities and (B) comprises executing a genetic algorithm comprising a uniform random crossover operator to produce a binary string representing said second population of entities.

51. (new) The method of claim 42, further comprising generating a binary string representing variable parameters of entities, forming said entities, evaluating said entities for a desired property, weighting said entities according to an hierarchy of fitness according to said property, selecting said first population as a sampling from said weighed entities and pairing said entities and step (B) comprises executing a genetic algorithm with a processor on said binary string to produce a binary string representing said second population of entities.

52. (new) The method of claim 42, further comprising conducting steps (A) and (B) on said second population of entities to produce a third population of entities.

53. (new) The method of claim 42, further comprising repeating steps (A) and (B) on said second population of entities and subsequent populations of entities until a fit entity is identified.

54. (new) The method of claim 42, wherein said HTS method is a combinatorial organic synthesis (COS).